JOBS F-102 & F-103

MEDOMAK RIVER HABITAT AND FISHERY INVESTIGATIONS

INTERIM SUMMARY REPORT NO. 1 (1997)

INTRODUCTION

From its source in Liberty to tidewater in Waldoboro, the Medomak River contains habitat for a wide variety of fish species, including stocked brown trout. Fisheries biologists from the Me. Department of Inland and Wildlife have recently quantified the habitat and fish populations of this river, and have monitored its water quality parameters at several sites.

OBJECTIVE

The primary objective of this study was to quantify the physical habitat of the Medomak River, with a secondary objective of collecting detailed data on water quality and fish populations throughout the watershed.

METHODS

Methods used were from the Fishery Division's 1989 Guidelines For Quantifying Physical Habitat, as modified from U.S. Fish and Wildlife Service's Habitat Evaluation Procedures. During July and August 1994, physical measurements of river width and depth were measured at selected transects. Depths were measured at three equidistant locations along a transect line established perpendicular to water flow. Width measurements were taken for both the wetted channel and from bank to bank for determination of width during full-river conditions. Substrate type, bank stability, riparian habitat, and percent shade, were categorized at each transect. Gradient was measured between transects and information was recorded regarding the size and water temperature of each tributary. Water temperatures were taken daily during the 1994 habitat survey, and additional water quality data were collected for dissolved oxygen content, pH, alkalinity, and conductivity during each site visit for electrofishing or gillnetting in 1990 and 1994-1996.

RESULTS

The Medomak River was divided into 3 sections of nearly equal length, according to habitat types. The river is 31 miles long and contains an estimated 181 acres. Based on changes in flow, substrate, and depth characteristics, the boundaries of the 3 sections of river were assigned as (1) the North Union Road, (2) State Route 220, (3) the head of tide. In the upper section above the North Union Road, 72% of the river's flow was rated as riffle or run, averaging less than 1 foot in depth. Substrate was gravel and rubble in 49% of this section. In the middle section, 79% of the river was rated deadwater, averaging slightly less than 3 feet in depth. Substrate was silt, muck, clay, sand, or ledge in 81% of this section. In lower section had 69% of the river flow was rated deadwater with a mean depth of more than 3 feet. Substrate was rated gravel and rubble in 61% of this section. Tables 1 & 2 summarize stream, flow, and substrate characteristics.

Because a deficiency was noted for a 1990 dissolved oxygen concentration measurement in a 22' deep pool near Orff's Corner several additional water quality measurements have been made in recent years at various sites. Results are summarized in Table 3.

Historical records and fishery sampling by gill netting and electrofishing have demonstrated the presence of both brook trout and brown trout, either from stocking or natural reproduction. Stocking history and fish collection results are summarized in Tables 4 & 5.

RECOMMENDATIONS

Based on our studies of the fish habitat, water quality, and fish populations, brown trout stocking sites were modified to increase survival and improve returns to the anglers. Annual stockings of 1000 spring yearling brown trout are recommended for the upper section, to be stocked at sites upstream of the North Union Road bridge where survival to older ages has been documented. During instances of surplus production in our hatcheries stockings of unscheduled brown trout may benefit the lower river. Because lack of cool water during the summer months limits wild brook trout survival, only low numbers of brook trout are expected to be caught.

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TABLE 1. Stream and Flow Characteristics, Medomak River, July-August 1994.

Section	Dimension (feet)				Area (feet^2)		
	Length	Width	Average Depth		Riffle	Run	Deadwater
Source to North Union Road	48,000	24	1.0		217,600 (16%)	782,000 (56%)	385,000 (28%)
				Average Depth	0.5	1.0	1.5
North Union Road to Route 220	56,200	40	2.5		125,900 (5%)	371,400 (16%)	1,801,600 (79%)
				Average Depth	1.4	1.9	2.7
Route 220 to Tidewater	51,600	80	3.0		596,100 (14%)	701,200 (17%)	2,885,000 (69%)
				Average Depth	1.0	1.4	3.5

TABLE 2. Substrate Characterization (Square Feet).

Section (Acreage)	Gravel	Rubble	Boulder or Ledge	Gravel and Rubble	Sand	Silt, Muck, or Clay
Source to North (32) Union Road	337,800	130,400	235,400	238,600	19,200	476,000
North (53) Union to Route 220	142,200	16,800	119,800	47,400	302,700	1,736,200
Route 220 to (96) Tidewater	349,000	1,376,400	747,600	848,000	27,800	819,500
Acreage	19	35	25	26	8	70

Table 3. Water Quality Observations, Medomak River, 1990 & 1994.

Date	Site	Depth	Dissolved Oxygen Content	Temp.^{o} C.	pH	Total Alkalinity
8/10/90	Near Orffs Corner	Surface	6.9ppm	24.0	6.4	10.0
		6.5 meters	1.0	15.5	6.5	49.0
	Below Ellard Road	Surface	6.2	24.0	6.5	11.0
		3.25 meters	0.3	13.5	6.2	101.0
8/23/94	Below Rt. 220	Surface	5.8	20.0	6.2	10.0
		3.6 meters	0.7	16.0	-	-
	Near Hope Brook	Surface	6.2	17.0	6.2	12.0
		3 meters	6.4	17.0	-	-
8/24/94	Behind VFW	Surface	8.4	18.0	6.4	10.0
	Winslows M.	“	8.7	19.5	6.5	10.0
	Wagner Brdg	“	8.5	20.0	6.4	9.0
8/25/94	Below Rt. 17	“	8.4	17.0	6.4	20.0
	Skidmore Rd	“	9.0	19.0	6.2	10.0
	N. Union Rd.	“	9.0	18.0	6.3	10.0
	Hatchery Bk.	“	-	19.0	6.5	3.0
	Fishtown Rd.	“	-	16.0	6.2	2.0
	Palermo Rd.	“	9.0	15.0	5.4	10.0
8/26/94	Below Wagner Brdg	“	8.9	19.0	6.2	4.0
	N. Union Rd.	“	10.0	19.5	6.3	3.0

Table 4. Stocking History of Brown Trout, Medomak River , Since 1985.

Date	Number	Size	Number per #	Age	Hatchery
Springs 1985-1987	1,000	6-8 inches	2.5-4.2	I+	New Gloucs. & Palermo
Spring 1987	1,585	8-10 inches	4.2	I+	Palermo
Spring 1988	1,000	6-8 inches	7.7	I+	“
Spring 1988	40	16-18 inches	0.2	VII+	New Gloucs.
Spring 1989	1,000	6-8 inches	7.3	I+	Palermo
Spring 1989	25,000	1.5- 2 inches	417	0	New Gloucs.
Springs 1990- 1995	1,000	6-10 inches	3.7-7.0	I+	Palermo
Spring 1995	27,738	1.5- 3 inches	134	0	New Gloucs.
Spring 1996	1,000	6-8 inches	4.0	I+	Palermo

Table 5. Fish Collection Results, Medomak River, since 1990.

Site	Date	Salmonid Captures	Num-bers & Size	Non-salmonid Captures	Density & Ages	Comments
Winslows Mills	7/31/90	none	-	EEL,WHS	common juv.& adults	E.F.,100 feet 26.5^{o} C
Ellard Rd.	"	none	-	EEL	"	E.F., 50 feet, 26.0^{o}C
Near Orffs Corner	8/2/90	none	-	WHS	common adults	G.N. depth- 22 feet
Fishtown Road bridge	8/16/90	none	-	EEL,WHS, BND	common juv.& adults	E.F.,250 feet 20.0^{o}C
near mouth of Hatchery Brook	8/16/90	BKT	2-8&12 inches	CMS,BND, CCB	common juv.& adults	E.F.,150 feet 21.0^{o}C
Washington Road(Rt.220)	8/23/94	none	-	11-PKL,1-WHS 13-LMB,8-YLP 3-PKS,33-SRA 23-GLS,2-EEL	common all repre-sented	E-Boat,½ mi. downsteam , 20.0^{o}C
Medomak P. to Hope Bk.	"	none	-	7-PKL,30-YLP 6-WHS, 9-PKS 2-WHP, 5LMB 82-GLS, 3-EEL 17-SRA, 1-CRA	common juv.& adults	E-Boat, 1 mi. upstream, 17.0^{o}C
Behind VFW Waldoboro	8/24/94	BNT	1-11 inches	44-SMB,1-BND 31-EEL,1-WHS	common juv.& adults	E.F., 100 feet 18.0^{o}C
Winslows Mills	"	none	-	79-LMB,1-WHS 42-EEL	common yoy,juv. & adults	E.F., 100 feet 19.5^{o}C
Wagner Bridge	"	none	-	12-SMB, 2-PKS 12-EEL	"	E.F., 80 feet 20.0^{o}C
Storer Pd. Rd. Crossing	8/25/94	none	-	4-LMB, 2-SMB 1-WHS, 1-GLS 1-PKS, 1-YLP 1CMS, 23-EEL	rare to common yoy,juv. &adults	E.F., 150 feet 17.5^{o}C
Skidmore Road	"	none	-	14-WHS,6-CMS 13-BND,1-NSK 18-MIN,16-EEL	rare to common juv.& adults	E.F., 150 feet 19.0^{o}C

TABLE 5. (continued)

Site	Date	Salmonid Captures	Num-bers & Size	Non-salmonid Captures	Density & Ages	Comments
N. Union Rd.	8/25/94	none	-	4-WHS, 4-SMB 19-CMS,7-BND 14-EEL	common juv.& adults	E.F., 175 feet 18.0°C
near mouth of Hatchery Brook	"	BKT	8-2 to12 inches	67-CCB,1-GLS 50-CMS,32-WHS 74-BND,3-NSK 2-CRA	common yoy,juv. &adults	E.F., 110 feet 19.0°C blackspot in CCB&BND
in Hatchery Brook	"	BKT	20-2 to6 inches	1-BND	rare juv.	E.F., 200 feet 14.0°C
Fishtown Road	"	none	-	24-BND, 2-WHS 11-CCB, 16-EEL	common juv. & adults	E.F., 85 feet 16.0°C
Palermo Road	"	none	-	12-WHS, 5-BND 20-CCB, 2-EEL	rare-juv. & adults	E.F., 100 feet 15.0°C
Wagner Bridge	8/26/94	none	-	24-SMB, 11-PKL 12-PKS, 1-BUL 1-GLS, 30-EEL	common yoy,juv. &adults	E-Boat , 1000 feet 19.0°C
¼ mile above N.Union Rd.	"	BNT	1- 11 inches	22-BND, 2-WHS 5-CCB, 3-CMS 1-MIN, 13-EEL	common juv. & adults	E.F., 100 feet 19.5°C
Skidmore Road	8/25/95	BNT	1- 4 inches	SMB,CMS, BND, EEL,WHS	common all ages	E.F., 300 feet 19.0°C
N. Union Rd.	"	BNT	5-8 to10 inches	"	"	E.F.,400 feet 19.0°C,blks pt
¼ mile above N.Union Rd	"	BNT	4-9 to10 inches	"	"	E.F.,300 feet 18.0°C
downstream of Rt. 105	"	BNT	3-8 to 9 inches	CMS, BND,EEL, WHS,GLS	"	E.F., 500 feet 16.0°C,blks pt
Skidmore Road	8/22/96	BNT	3-9 to12 inches	LMB, CMS,BND EEL	"	E.F., 300 feet 22.0°C
N.Union Rd.	"	BNT	1- 9 inches	YLP, PKS, CMS, BND,EEL	"	E.F.,400 feet 22.0°C
¼ mile above	"	BNT	4-4 to10	CMS, BND,EEL,	"	E.F., 300

N.Union Rd		BKT	inches 1- 7 inches	WHS		feet 20.0°C
downstream of Rt. 105	“	BNT	3-9 to11 inches	CMS, BND,EEL, WHS, PKS	“	E.F.,400 feet 22.0°C